IN THE UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF PENNSYLVANIA

UNITED STATES OF AMERICA,

Plaintiff

v.

: CIVIL ACTION NO.

CITY OF READING, PENNSYLVANIA,

Defendant

COMPLAINT

The United States of America ("United States), by the authority of the Attorney

General of the United States and through its undersigned counsel, acting at the request and on

behalf of the Administrator of the United States Environmental Protection Agency ("EPA"), files
this Complaint and alleges as follows:

NATURE OF THE ACTION

1. This is a civil action brought pursuant to Section 309(b) and (d) of the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 and the Water Quality Act of 1987 (the "Clean Water Act" or "the Act") 33 U.S.C. § 1319(b) and (d), for permanent injunctive relief and assessment of civil penalties against the City of Reading, Pennsylvania, ("City" or "Reading") regarding the operation of the City's publicly owned sewage treatment plant. The United States alleges that the City discharged and/or continues to discharge pollutants into navigable waters of the United States in violation of Sections 301 and 307 of the Act, 33 U.S.C. §§ 1311 and 1317, and the conditions and limitations of National Pollutant Discharge Elimination System ("NPDES") Permit number 0026549 issued to the City by the Commonwealth of Pennsylvania pursuant to Section 402 of the Act, 33 U.S.C. § 1342.

JURISDICTION, VENUE, AUTHORITY AND NOTICE

- 2. This Court has jurisdiction over the subject matter of this action pursuant to Section 309(b) of the Act, 33 U.S.C. § 1319(b), and 28 U.S.C. §§ 1331, 1345, and 1355.
- 3. Venue lies in the Eastern District of Pennsylvania pursuant to Section 309(b) of the Act, 33 U.S.C. § 1319(b) and 28 U.S.C. § 1391(b) and (c) because it is the judicial district where the City of Reading is located and where the alleged violations occurred.
- 4. The United States has authority to bring this action on behalf of the Administrator of EPA ("Administrator") under Section 506 of the Act, 33 U.S.C. § 1366, and under 28 U.S.C. § 516 and 519.
- 5. Notice of the commencement of this action has been given to the Commonwealth of Pennsylvania pursuant to Section 309(b) of the Act, 33 U.S.C. § 1319(b) which files a motion for intervention and complaint as co-plaintiff herewith.
- 6. Defendant, City of Reading, is a political subdivision of the Commonwealth of Pennsylvania, a "municipality" within the meaning of Section 502 (4) of the Act, 33 U.S.C. § 1362 (4) and a "person" within the meaning of Section 502 (5) of the Act, 33 U.S.C. § 1362 (5).
- 7. At all relevant times, the City of Reading owned and operated a wastewater treatment plant (the "Plant"), a Publicly Owned Treatment Works ("POTW") within City limits.

STATUTORY BACKGROUND

8. Section 301(a) of the Act, 33 U.S.C. § 1311(a), prohibits the discharge of pollutants into the waters of the United States by any person except in accordance with certain provisions, including Section 402 of the Act, 33 U.S.C. § 1342.

- 9. Section 307 of the Act, 33 U.S.C. § 1317, prohibits the discharge of toxic pollutants into the waters of the United States from any owner or operator of any source and by a POTW in violation of pretreatment requirements set forth in Section 307 of the Act.
- 10. Section 402 of the Act, 33 U.S.C. § 1342, provides authority for the EPA

 Administrator to issue permits for the discharge of any pollutant consistent with the other

 provisions of the Act. Such permits, termed National Pollutant Discharge Elimination System

 ("NPDES") permits, allow the discharge of pollutants by any person into the waters of the United

 States subject to terms and conditions, including conditions for effluent limitations, the

 development and implementation of pretreatment programs for POTW, and such other

 requirements as set forth therein.
- 11. Effluent limitations, as defined in Section 502(11) of the Act, 33 U.S.C. § 1362(11), are restrictions on the quantity, rate, and concentration of chemical, physical, biological, and other constituents of wastewater discharges. Effluent limitations are among the conditions and limitations prescribed in NPDES permits issued under Section 402(a) of the Act, 33 U.S.C. § 1342(a).
- 12. Section 402(b) of the Act, 33 U.S.C. § 1342(b), provides authority for the EPA Administrator to authorize a state to operate its own NPDES permit program, provided the state program meets certain specific criteria.
- 13. By Memorandum of Agreement dated July 5, 1978, and renewed on May 15, 1991, the EPA Administrator authorized Pennsylvania to administer an NPDES program pursuant to these statutory and regulatory provisions.

- 14. EPA retains concurrent enforcement authority pursuant to Section 402(i) of the Act, 33 U.S.C. § 1342(i).
- 15. As required by Section 307 of the Act, 33 U.S.C. § 1317, EPA promulgated the General Pretreatment Regulations for Existing and New Sources of Pollution at 40 C.F.R. Part 403, which establish the "responsibilities of Federal, State, and local government, industry and the public to implement National Pretreatment Standards to control pollutants which pass through or interfere with treatment processes [in POTWs]." 40 C.F.R. § 403.1(a). Specifically these regulations require an approved pretreatment program to: (a) prevent the introduction of pollutants into POTWs which will interfere with the operation of a POTW ("interference"); (b) prevent the introduction of pollutants into POTWs which will pass through the treatment works or otherwise be incompatible with such works ("pass through"); and (c) improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges. 40 C.F.R. § 403.2. Under the national pretreatment program, an industrial user may not introduce into a POTW any pollutant(s) which causes pass through or interference. Id. § 403.5(a). Local limits that are designed to prevent pass through and interference, and are part of an approved Pretreatment Program are also National Pretreatment Standards as defined in 40 C.F.R. §§ 403.3 (j) and 403.5(d).
- 16. Section 309(b) and (d) of the Act, 33 U.S.C. § 1319(b) and (d), authorizes the United States to commence actions for injunctive relief and/or civil penalties for violation of Sections 301, 307, and 402 of the Act, 33 U.S.C. §§ 1311, 1317, and 1342, as well as the conditions and limitations of NPDES permits.

17. The Act, 33 U.S.C. § 1319(b), provides for civil penalties of up to \$25,000 per day for each violation occurring prior to January 30, 1997. Pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990, as amended by the Debt Collection Improvement Act of 1996 and 40 C.F.R. Parts 19 and 27, for violations committed after January 30, 1997, the Clean Water Act provides civil penalties of up to \$27,500 per day for each violation and for violations committed after March 15, 2004, penalties up to \$32,500 per day for each.

FACTUAL ALLEGATIONS

- 18. The City's Sewage Treatment Plant ("the Plant") is located at Route 10, Morgantown Road, Berks County, Reading, PA 19601.
- 19. The City owns the Plant and operates it pursuant to NPDES Permit Number PA 0026549 issued by the Commonwealth of Pennsylvania Department of Environmental Protection (PADEP).
- 20. As part of the operation of the Plant, the City collects, treats and/or generates wastewater containing "pollutants," as that term is defined in Section 502(6) of the Act, 33 U.S.C. § 1362(6) and 40 C.F.R. § 122.2.
- 21. The Plant receives sewage for treatment from sewer lines serving all or part of the following communities in Berks County: Alsace Township, Bern Township, Cumru Township, Kenhorst Borough, Laureldale Borough, Mohnton Borough, Mt. Penn Borough, Muhlenberg Township, Robeson Township, Shillington Borough, Spring Township, Wyomissing Borough, and the City of Reading.

- 22. At all relevant times, in addition to domestic sewage, the Plant has and continues to accept significant amounts of wastewater containing pollutants from industrial users including but not limited to dairies, food manufacturing plants, dyeing operations, a battery manufacturer, automotive/truck service facilities, and meat processing plants.
- 23. The City discharges the wastewater generated, collected, and treated at the Plant into the Schuylkill River, a tributary of the Delaware River. For this portion of the Schuylkill River, Pennsylvania has adopted water quality standards designed to protect the beneficial water uses of recreation, and as a source of drinking water as well as the aquatic life uses. 2 5 PA Code § 93.9.
- 24. The Schuylkill River is a navigable water as that term is defined in 33 U.S.C. § 1362(7).
- 25. Pursuant to Section 307 of the Act, 33 U.S.C. § 1317 and implementing regulations at 40 C.F.R. § 403.8, Reading was required to develop a pretreatment program. EPA approved the submission of the City's initial Pretreatment Program in 1986. EPA has approved several subsequent modifications of the City's Pretreatment Program including approval of the City's Enforcement Response Plan ("ERP") in November 1999 and local limits with which industrial users must comply. The approved Pretreatment Program sets forth requirements for the City and certain industrial users contributing wastewater to the Plant.
- 26. As part of its approved Pretreatment Program the City issues local permits to certain industrial users (IUs) authorizing those IUs to discharge to the Plant wastewater containing pollutants in amounts and concentrations not to exceed the limitations set forth in that permit and/or other applicable requirements of the Pretreatment Program.

- 27. In accordance with EPA requirements for its approved Pretreatment Program in order to ensure compliance, the City has adopted an Enforcement Response Plan specifying the actions the City shall take if any industrial user violates applicable local limits or otherwise causes or contributes to pass through (violation of NPDES effluent limits or requirements) or interference (upset of Plant treatment process). The purpose of this ERP is to ensure compliance by IUs with the requirements of the Pretreatment Program.
- 28. NPDES Permit Number PA0026549 contains effluent limitations and other conditions including but not limited to the following requirements set forth on page 14 of the Permit, Part C.II.A., for the City: "implement an industrial pretreatment program in accordance with the federal Clean Water Act, the Pennsylvania Clean Streams Law, and the federal General Pretreatment Regulations (40 C.F.R. 403). The program shall be implemented in accordance with the pretreatment program, and any modifications submitted by the permittee and approved by the Approval Authority."
- 29. NPDES Permit Number PA0026549 at page 10, Part B.I.D Facilities Operation Section requires the City to "at all times maintain in good working order and properly operate and maintain all facilities and systems which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit."

FIRST CLAIM FOR RELIEF (Violation of Effluent Limits)

- 30. Paragraphs 1-29 are realleged and incorporated by reference.
- 31. On numerous occasions since at least April, 1999, the City has discharged pollutants from Outfall 001 at the Plant into the Schuylkill River in violation of various effluent

limits in NPDES permit No. PA0026549 including those limits for Ammonia-Nitrogen (NH₃-N), Dissolved Oxygen (DO) Fecal Coliform, Total Suspended Solids (TSS), Chlorine, Cyanide, Mercury, and Carbonaceous Biologic Oxygen Demand (CBOD). See Table 1 of NPDES Effluent Violations attached to the Complaint specifically incorporated herein by reference.

- 32. The outfall designated Point Source 001 is a "point source" within the meaning of Section 502(14) of the Act, 33 U.S.C. § 1362(14).
 - 33. Unless enjoined, the City's violations will continue.
- 34. Pursuant to 33 U.S.C. § 1319(b) and (d), Reading is liable for permanent injunctive relief and civil penalties of up to \$27,500 per day for each violation occurring after January 30, 1997 and up to \$32,500 per day for each violation occurring after March 15, 2004.

SECOND CLAIM FOR RELIEF (Pretreatment Program Violations)

- 35. Paragraphs 1-29 are realleged and incorporated by reference.
- 36. In accordance with requirements of the its Pretreatment Program, Reading has issued numerous Notices of Violation to significant industrial users (SIUs) for failing to discharge pollutants in compliance with applicable local limits, failing to sample and/or failing to report information required by the City's pretreatment program requirements. On several occasions, Reading has assessed but not collected penalties for certain SIUs for continuing violations of pretreatment program requirements.
- 37. On numerous occasions the City has not fully and effectively exercised and implemented its pretreatment program legal authorities and procedures (as described above in Paragraphs 25-28) to ensure compliance of certain SIUs with applicable pretreatment standards

and requirements where those SIUs chronically discharged pollutants above local limits, failed to sample and/or failed to report.

- 38. Failure to ensure compliance of certain SIUs in chronic violation of pretreatment requirements is a violation of the City's Enforcement Response Plan (ERP), part of the City's EPA-approved Pretreatment Program and a violation of the NPDES permit condition set forth in Part C. II.
- 39. By its activities detailed in Paragraphs 35 through 38, Reading has violated requirements of the Pretreatment Program, NPDES permit conditions and federal pretreatment requirements set forth in 40 C.F.R. §§ 403.5(c)(1) & (2) & 403.8(f).
 - 40. Unless enjoined, the City's violations will continue.
- 41. Pursuant to 33 U.S.C. § 1319(b) and (d), Reading is liable for permanent injunctive relief and civil penalties of up to \$27,500 per day for each violation occurring after January 30, 1997 and up to \$32,500 per day for each violation occurring after March 15, 2004.

THIRD CLAIM FOR RELIEF (Failure to Properly Operate and Maintain Plant)

- 42. Paragraphs 1-29 are realleged and incorporated by reference.
- 43. On numerous occasions since 1997, the City has not properly operated and maintained Plant facilities and systems which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Those occasions include but are not limited to failure to manage hydrogen sulfide impacts, failure to repair broken equipment, failure to properly treat dye waste impacts leading to problems meeting ammonia-nitrogen limitations, failure to operate treatment units and failure to maintain qualified staff to properly operate the

Plant.

- 44. Unless enjoined, Reading's violations will continue.
- 45. Pursuant to 33 U.S.C. § 1319(b) and (d), Reading is liable for permanent injunctive relief and civil penalties of up to \$27,500 per day for each violation occurring after January 30, 1997 and up to \$32,500 per day for each violation occurring after March 15, 2004.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff, the United States of America, respectfully prays that this Court:

- 1. Permanently enjoin the City of Reading from discharging pollutants except as expressly authorized by the Act, Pretreatment Program and the limitations and conditions of the applicable NPDES Permit.
- 2. Order the City of Reading to take all steps necessary to comply with the Act,
 Pretreatment Program and the limitations and conditions of the applicable NPDES Permit.
- 3. Order the City of Reading to take all steps necessary to redress or mitigate the impact of its discharges into the Schuylkill River in violation of the Act, Pretreatment Program and the applicable NPDES Permit.
- 4. Assess civil penalties against the City up to \$27,500 per day for each violation of the Federal Water Pollution Control Act or the applicable NPDES permit occurring before March 15, 2004 and up to \$32,500 per day for each violation occurring after March 15, 2004.

- 5. Award the United States its costs of this action.
- 6. Grant such other and further relief as the Court may deem appropriate.

Respectfully submitted,

W. BENJAMIN FISHEROW Deputy Chief, Environmental Enforcement Section Environment and Natural Resources Division U.S. Department of Justice Washington, DC 20005

PATRICK L. MEEHAN United States Attorney

VIRGINIA A. GIBSON Assistant United States Attorney Chief, Civil Division

MARGARET L. HUTCHINSON Assistant United States Attorney United States Attorney's Office 615 Chestnut Street, Suite 1250 Philadelphia, PA 19106

OF COUNSEL

CHRISTOPHER DAY
Assistant Regional Counsel
Office of Regional Counsel
Region III (3RC20)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Page 1/5 DMRs through 06/2004

Reading NPDES Permit No. PA 0026549				DMRs through 06/2004
Month-Year	Parameter	Permit Limit	Reported DMR Value	Duration Factor (Units)
Apr-02	DO	5.0	1.6	minimum (mg/l)
Apr-02	TSS	30	41	Monthly Avg.(mg/l)
Apr-02	TSS	45	54	Weekly Avg. (mg/l)
Apr-02	NH4N as N	18	25	Monthly Avg. (mg/l)
May-02	DO	5.0	1.4	minimum (mg/l)
	14 DO vio's			,
May-02	CBOD	20	21	Monthly Avg. (mg/l)
May-02	NH4N as N	6.0	21.2	Monthly Avg. (mg/l)
May-02	NH4N as N	1000	2921	Monthly Avg. (lbs/d)
Jun-02	DO	5.0	3.6	minimum (mg/l)
	19 DO vio's			
Jun-02	NH4N as N	6.0	23.2	Monthly Avg. (mg/l)
Jun-02	NH4N as N	1000	2642	Monthly Avg. (lbs/d)
Jul-02	DO	5.0	4.3	minimum (mg/l)
	20 DO vio's			
Jul-02	NH4N as N	6.0	17.1	Monthly Avg. (mg/l)
Jul-02	NH4N as N	1000	1856	Monthly Avg. (lbs/d)
Jul-02	mercury, total	0.017	<0.0222	Monthly Avg. (lbs/d)
Jul-02	mercury, total	0.00007	<0.0002	Monthly Avg. (mg/l)
Aug-02	mercury, total	0.00007	<0.0002	Monthly Avg. (mg/l)
Aug-02	mercury, total	0.017	<0.024	Monthly Avg. (lbs/d)
Aug-02	DO	5.0	4.7	minimum (mg/l)
	7 DO vio's			
Aug-02	NH4N as N	6.0	10.9	Monthly Avg. (mg/l)
Aug-02	NH4N as N	1000	1165	Monthly Avg. (lbs/d)

Page 2/5 DMRs through 06/2004 Reading Effluent Violations

Reading Efficient violations Divirs inrough 00/2004					
Month-Year	Parameter	Permit Limit	Reported DMR Value	Duration Factor (Units)	
Sep-02	DO	5.0	3.5	minimum (mg/l)	
	2 DO vio's			·	
Sep-02	NH4N as N	6.0	6.9	Monthly Avg. (mg/l)	
Sep-02	mercury, total	0.017	<0.022	Monthly Avg. (lbs/d)	
Sep-02	mercury, total	0.00007	<0.0002	Monthly Avg. (mg/l)	
Oct-02	mercury, total	0.00007	<0.0002	Monthly Avg. (mg/l)	
Oct-02	mercury, total	0.017	<0.030	Monthly Avg. (lbs/d)	
Oct-02	NH4N as N	6.0	9.0	Monthly Avg. (mg/l)	
Oct-02	NH4N as N	1000	1192	Monthly Avg. (lbs/d)	
Nov-02	DO	5.0	3.3	minimum (mg/l)	
	3 DO vio's				
Nov-02	mercury, total	0.017	<0.029	Monthly Avg. (lbs/d)	
Nov-02	mercury, total	0.00007	<0.00023	Monthly Avg. (mg/l)	
Dec-02	mercury, total	0.00007	<0.0002	Monthly Avg. (mg/l)	
Dec-02	mercury, total	0.017	<0.034	Monthly Avg. (lbs/d)	
Dec-02	DO	5.0	4.6	minimum (mg/l)	
Jan-03	NH4N as N	18	19	Monthly Avg. (mg/l)	
Jan-03	mercury, total	0.00007	<0.0002	Monthly Avg. (mg/l)	
Jan-03	mercury, total	0.017	<0.028	Monthly Avg. (lbs/d)	
Feb-03	mercury, total	0.017	<0.020	Monthly Avg. (lbs/d)	
Feb-03	mercury, total	0.00007	<0.00011	Monthly Avg. (mg/l)	
Feb-03	DO	5.0	4.0	minimum (mg/l)	
	3 DO vio's				
Feb-03	TSS	30	39	Monthly Avg. (mg/l)	
Feb-03	TSS	45	48	Weekly Avg. (mg/l)	

TSS

May-03

Page 3/5 DMRs through 06/2004 Reading Effluent Violations Permit Reported **Duration Factor** Parameter Month-Year Limit DMR Value (Units) 18 21 Monthly Avg. (mg/l) NH4N as N Feb-03 3090 Monthly Avg. (lbs/d) 3000 Feb-03 NH4N as N 7988 Weekly Avg.. (lbs/d) **CBOD** 6255 Feb-03 4170 4931 Monthly Avg. (lbs/d) Feb-03 CBOD **CBOD** 25 32 Monthly Avg. (mg/l) Feb-03 25 32 Monthly Avg. (mg/l) **CBOD** Mar-03 5510 Monthly Avg. (lbs/d) 4170 **CBOD** Mar-03 18.1 Monthly Avg. (mg/l) NH4N as N 18 Mar-03 Monthly Avg. (lbs/d) NH4N as N 3000 3080 Mar-03 DO 5.0 3.9 minimum (mg/l) Mar-03 11 DO vio's Monthly Avg. (mg/l) 30 47 TSS Mar-03 Weekly Avg. (mg/l) 45 60 **TSS** Mar-03 Monthly Avg. (lbs/d) 7130 8237 Mar-03 TSS minimum (mg/l) 2.2 DO 5.0 Apr-03 30 56 Monthly Avg. (mg/l) TSS Apr-03 45 62 Weekly Avg. (mg/l) TSS Apr-03 8567 Monthly Avg. (lbs/dl) 7130 TSS Apr-03 10696 Weekly Avg. (lbs/d) 10738 TSS Apr-03 25 Monthly Avg. (mg/l) **CBOD** 31 Apr-03 4802 Monthly Avg. (lbs/d) 4170 **CBOD** Apr-03 45 56 Weekly Avg. (mg/l) **TSS** May-03 2.23 minimum (mg/l) 5.0 DO May-03 9 DO vio's 30 49 Monthly Avg. (mg/l)

Page 4/5 DMRs through 06/2004

Reading Effluen		1	T	DMRs through 06/2004
Month-Year	Parameter	Permit Limit	Reported DMR Value	Duration Factor (Units)
May-03	fecal coliform	200	261	Monthly Avg. (#/100ml)
May-03	NH4N as N	6.0	16.77	Monthly Avg. (mg/l)
May-03	NH4N as N	1000	2194	Monthly Avg. (lbs/d)
Jun-03	NH4N as N	1000	2383	Monthly Avg. (lbs/d)
Jun-03	NH4N as N	6.0	13.1	Monthly Avg. (mg/l)
Jun-03	TSS	30	48	Monthly Avg. (mg/l)
Jun-03	TSS	45	58	Weekly Avg. (mg/l)
Jun-03	TSS	7130	9393	Monthly Avg. (lbs/dl)
Jun-03	TSS	10696	13308	Weekly Avg. (lbs/d)
Jun-03	DO	5.0	4.36	minimum (mg/l)
Jul-03	DO	5.0	4.16	minimum (mg/l)
Jul-03	TSS	30	31	Monthly Avg. (mg/l)
Jul-03	mercury, total	0.00007	<0.00008	Monthly Avg. (mg/l)
Jul-03	NH4N as N	6.0	14.58	Monthly Avg. (mg/l)
Jul-03	NH4N as N	1000	1992	Monthly Avg. (lbs/d)
Aug-03	NH4N as N	1000	1482	Monthly Avg. (lbs/d)
Aug-03	NH4N as N	6.0	11.59	Monthly Avg. (mg/l)
Aug-03	DO	5.0	3.85	minimum (mg/l)
Sep-03	mercury, total	0.00007	<0.00008	Monthly Avg. (mg/l)
Sep-03	DO	5.0	2.32	minimum (mg/l)
09/04/03	DO	5.0	3.96	minimum (mg/l)
09/19/03	DO	5.0	4.66	minimum (mg/l)
Oct-03	no violations			
Nov-03	no violations			

Page 5/5 DMRs through 06/2004

Reading Effluen	t Violations			DMRs through 06/2004
Dec-03	DO	5.0	3.73	minimum (mg/l)
Jan-04				1 Cl sample missed
Feb-04	TSS	30	36	Monthly Avg. (mg/l)
Feb-04	TSS	45	62	Weekly Avg. (mg/l)
Feb-04	TSS	10696	13124	Weekly Avg. (lbs/day)
Mar-04	TSS	30	35	Monthly Avg. (mg/l)
Apr-04	DO	5.0	4.4	minimum (mg/l)
04/23/04	DO	5.0	4.7	minimum (mg/l)
Apr-04	TSS	30	40	Monthly Avg. (mg/l)
May-04	DO	5.0	4.5	minimum (mg/l)
05/12/04	DO	5.0	4.9	minimum (mg/l)
05/23/04	DO	5.0	4.5	minimum (mg/l)
May-04	NH4N as N	6.0	9.86	Monthly Avg. (mg/l)
May-04	NH4N as N	1000	1,449	Monthly Avg. (lbs/d)
Jun-04	NH4N as N	6.0	7.76	Monthly Avg. (mg/l)
Jun-04	NH4N as N	1000	1243	Monthly Avg. (lbs/d)

Explanation of Terms

DMR - Discharge Monitoring Report

DO - Dissolved oxygen

TSS - Total suspended solids

NH4N as N - Ammonia Nitrogen

CBOD5 - Carbonaceous biologic oxygen demand